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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/699,438

10/31/2003

Young Hee Mun

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3273

4743

7590

12/14/2005

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EXAMINER

GUERRERO, MARIA F

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/699,438

Applicant(s)

MUN ET AL.

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-8 and 10-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This Office Action is in response to the Amendment filed September 19, 2005.

#### **Status of Claims**

2. Claim 2, 9, and 14-46 are canceled. Claims 1, 3-8 and 10-13 are pending.

#### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on September 19, 2005 has been considered.

#### ***Priority***

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Claim Objections***

5. Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 10 is dependent from the canceled claim 9.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3-8 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Falster et al. (US 5,994,761).

Falster et al. shows a silicon wafer having a front surface, a back surface, a circumferential edge portion and a region between the front and back surfaces (col. 2, lines 35-40, 55-67). Falster et al. discloses the silicon wafer comprising a first denuded zone formed to a predetermine distance from the front surface, a second denuded zone formed to a predetermine distance from the back surface (Figs. 1-4, col. 3, lines 1-27). Falster et al. teaches a bulk region formed between the first and the second denuded zones (col. 7, lines 57-67).

Furthermore, Falster et al. describes a concentration profile of defects in the bulk region having a distribution that is maintained substantially constant in a direction from the front to the back surface (Figs. 1-4, col. 7, lines 60-67, col. 13, lines 10-22). Falster et al. shows the concentration of defects being maintained constant in a range of about  $1 \times 10^7$  to about  $5 \times 10^{10}$  precipitates/cm<sup>3</sup> (col. 8, lines 1-7). Falster et al. teaches the distances of the first and the second zones being at least about 5, 20, 30, 40 micrometers (col. 8, lines 8-45). Falster et al. teaches the concentration profile of defects having stepwise shape having an axial symmetry at the center between the front and back surfaces of the wafer (Figs. 1-9). Falster et al. discloses the bulk region

Art Unit: 2822

having vertically rising concentration gradients at boundaries of the first and second denuded zones and a horizontal concentration gradient over the bulk region and the variation being about 10% or less (Figs. 1-9, col. 8, lines 35-50).

7. In addition, the elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. In *re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Therefore, the claims are anticipated by Falster et al.

8. Claims 1 and 3-4 and are rejected under 35 U.S.C. 102(b) as being anticipated by Nadahara et al. (US 5,502,010).

Nadahara et al. shows a silicon wafer having a front surface, a back surface, a circumferential edge portion and a region between the front and back surfaces (Fig. 11A, col. 2, lines 35-40, 55-67). Nadahara et al. discloses the silicon wafer comprising a first denuded zone formed to a predetermine distance from the front surface, a second denuded zone formed to a predetermine distance from the back surface (col. 1, lines 40-67, col. 2, lines 1-35, col. 4, lines 1-13). Nadahara et al. teaches a bulk region formed between the first and the second denuded zones (col. 1, lines 40-67, col. 2, lines 1-35, col. 4, lines 1-13).

9. Furthermore, Nadahara et al. describes a concentration profile of defects (BMD) (between  $10^7$  defectes/cm<sup>3</sup> and  $10^9$  defects/cm<sup>3</sup> in the bulk region having a distribution that is maintained substantially constant in a direction from the front to the back surface (col. 4, lines 1-13).

***Response to Arguments***

10. Applicant's arguments filed September 19, 2005 have been fully considered but they are not persuasive. Claims 1, 3-8 and 11-13 stand rejected. New rejection of claims 1 and 3-4 in view of Nadahara et al. (cited on IDS).

Applicant argued that Falster shows that the peak value of vacancy concentration exists, and provides a silicon wafer having a vacancy profile in which the peak density of the vacancies is at or near the central plane with the concentration generally decreasing in the direction of the front surface. In the invention, on the other hand, the bulk micro defects including oxygen precipitates and bulk stacking faults are substantially uniform. Nevertheless, Falster et al. describes a concentration profile of defects in the bulk region having a distribution that is maintained substantially constant in a direction from the front to the back surface (Figs. 1-4, col. 7, lines 60-67, col. 13, lines 10-22). Falster et al. shows the concentration of defects being maintained constant in a range of about  $1 \times 10^7$  to about  $5 \times 10^{10}$  precipitates/cm<sup>3</sup> (col. 8, lines 1-7).

Furthermore, "The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain." In re Heck, 699 F.2d 1331, 1332-33, 216 USPQ 1038, 1039 (Fed. Cir. 1983) (quoting In re Lemelson, 397 F.2d 1006, 1009, 158 USPQ 275, 277 (CCPA 1968)). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories,

Art Unit: 2822

874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir.1998).

Furthermore, during patent examination, the pending claims must be “given  
\*>their< broadest reasonable interpretation consistent with the specification.” > In re  
Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). While the claims  
of issued patents are interpreted in light of the specification, prosecution history, prior  
art and other claims, this is not the mode of claim interpretation to be applied during  
examination. During examination, the claims must be interpreted as broadly as their  
terms reasonably allow. > In re American Academy of Science Tech Center, F.3d, 2004  
WL 1067528 (Fed. Cir. May 13, 2004)(The USPTO uses a different standard for  
construing claims than that used by district courts; during examination the USPTO must  
give claims their broadest reasonable interpretation.) < This means that the words of the  
claim must be given their plain meaning unless applicant has provided a clear definition  
in the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir.  
1989) >; *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d  
1857 (Fed. Cir. 2004). Therefore, the words in the claims have been given their plain  
meaning.

Regarding the claimed range of variation of about 10% or less, the claimed range  
is not specific because is an open range. In addition, the Rejection is maintained  
because Applicant failed to present any evidence of criticality or unexpected results. In

re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 - § 716.02(g) for a discussion of criticality and unexpected results.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Inoue et al. (US 5,502,331) (cited on IDS) and Park (US 6,485,807) (cited on IDS) are presented as evidence to show that a person of ordinary skill in the art would recognize that the defects described by Falster et al. are in fact bulk microdefects (BMD).

12. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on September 19, 2005 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



Art Unit: 2822

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 9, 2005

  
**MARIA F. GUERRERO**  
**PRIMARY EXAMINER**